REMARKS

Claims 1-19 are pending in the application. Claims 1-7 and 15-17 are rejected. Claims 8-14 and 16-20 are objected to because of improper multiple dependency. No claims are considered to be allowable.

Applicants have amended claims 1-3, 5-7, 8-15 and 17-20. The amendments to claims 1-3 and 5-7 are intended to clarify the invention with respect to the relative timing of the steps, to emphasize the continuous flow of the glass melt in forming the glass gobs. Applicants also have amended claim 15 to incorporate the limitations of claim 16 and to further incorporate the feature that the glass melt is cooled when brought into contact with the support member that is cooled by circulation of a coolant through the support member, as taught in original paragraph [0082]. Claim 16 has been cancelled and claims 17-19 have been amended, in order to overcome the objection to the claims on the basis of improper multiple dependency. New claim 21 has been added and is supported by original disclosure at paragraph [0035] of the application. .

Claim Objections

At page 2 of the Office Action, claims 8-14 and 18-20 are objected to because they are multiple dependent claims that depend from other multiple dependent claims. Since such claims are inconsistent with U.S. practice, Applicants have amended claims 8-14, in order to remove their improper multiple dependency and to make them depend only from independent claims 1-3 and 5-7.

Finally, Applicants note that the listing of objectionable claims on the Summary of Office Action (page 1) is inconsistent with the listing at page 2. Applicant's representative contacted the Examiner and he advised that only claims 8-14 and 18-20 are objectionable, as noted in a subsequently issued Interview Summary.

Claim Rejections - 35 U.S.C. § 112

Claims 1-4 are rejected under 35 USC 112, second paragraph, as being indefinite. This rejection is traversed for at least the following reasons.

The Examiner identifies the phrase "one cycle of preparing one glass gob from the glass melt flow" as being a basis for indefiniteness because it has not been adequately defined. Applicants have deleted "one cycle" and have defined a "gob preparation period," consistent with the original disclosure as understood by one skilled in the art. Please note that Applicants retained the "one cycle" limitation in claims 5-7, as there has been no objection to those claims.

Claim Rejection - 35 U.S.C. § 103

Claims 1-7 and 15-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeuchi et al (5,738,701) in view of Yoshikuni et al. This rejection is traversed for at least the following reasons.

As a preliminary matter, Applicants note that the Examiner has clarified the rejection in the Interview Summary, thereby making the rejection based on a combination of Ikeuchi et al (5,738,701) in view of Yoshikuni et al.

Yoshikuni et al

As a further preliminary matter, Applicants note that the Yoshikuni et al patent is owned on its face by Hoya Corporation and is available only as Section 102(e) prior art since it issued on February 15, 2005, **after** the US filing date of the present application. The present application is assigned to Hoya Corporation, on the basis of an assignment recorded at reel 015669, frame 0620 on July 29, 2004. Thus, Applicants respectfully exercise their rights under 35 U.S.C. § 103(c) and request that the Yoshikuni et al patent be removed from consideration.

Ikeuchi et al

Although the rejection is overcome by removal of Yoshikuni et al, Applicants will take this opportunity to demonstrate how the presently claimed invention is distinguishable over Ikeuchi et al. In this regard, as a preliminary matter, Applicants note the Examiner's admission at page 4 of the Office Action that Ikeuchi et al "is silent regarding the timing of the transfer process with respect to the timing of the gob formation process."

Applicants agree that this key feature is missing. As this is the key feature of the present invention and, as specifically set forth in claims 1-14, is not taught in any cited prior art, these

claims should be patentable. Moreover, as noted subsequently, this feature would not be expected from Ikeuchi et al, without further additional prior art teaching.

However, to the extent that the Examiner intends the foregoing statement to list that which is missing in Ikeuchi, Applicants disagree. Applicants respectfully submit that, in addition to the above feature, the Ikeuchi reference is silent about the following features as well:

1) use of both a support member and a glass forming member,

2) transfer of a separated glass gob from the support member to the glass forming member, and

3) transfer of a separated glass gob from the support member may be made to a moving glass forming member.

As regards feature 1) and 2), the Examiner mentions on the same paragraph that Ikeuchi teaches that "the thus-obtained glass gob, ... or **may be press molded prior to cooling solidification".** (The emphasis was added by the Examiner.)

However, in the method of claims 1-7 of the present application, the glass gob transferred from the support member to the glass forming member is not intended to be press molded in the glass forming member. The glass gob is formed to a glass articles such as a glass preform without press molding. The glass preform thus obtained subsequently will be heated and press molded into a glass optical element. Thus, Applicants respectfully submit that Ikeuchi et al does not teach use of a glass forming member which is not a pressing mold and thus does not teach the above features 1) and 2). As to the various groups of claims, Applicants have the following comments.

Claims 1-3

The present invention concerns a method of manufacturing glass articles by continuously separating glass gobs from a glass melt flow that is continuously flowing out of a nozzle. The separated glass gobs are formed with glass forming members that are intermittently or continuously moving. In order to achieve a high throughput and yield in accordance with the

present invention, at a level of 20-100 DPM, as discussed at paragraph [0106], several techniques for forming the gobs at a desired weight are disclosed and claimed.

As described at paragraph [0025], a manufacturing method 1-1 for a first mode is characterized by a support member that approaches the front end of the nozzle such that the front end of the glass melt flow is received by the support member. Then, the support member is dropped faster than the flow rate of the glass melt flow to separate a glass gob from the glass melt flow. The separated glass gob is then transferred to a glass forming member that is either stopped or moving.

In accordance with manufacturing method 1-2 for the first mode, as explained at paragraph [0026], the support member approaches the front end of the nozzle and the front end of the glass melt flow is received by the support member. While supporting the front end, a constriction is made between the nozzle side and the support side of the glass flow melt and the support member is dropped rapidly to separate a glass gob from the glass melt flow and the constriction. The separated glass gob is then transferred to a glass forming member that has either stopped removing.

In accordance with manufacturing method 1-3 for the first mode, as explained at paragraph [0027], the support member approaches the front end of the nozzle and the front end of the glass melt flow is received by the support member. While supporting the front end, a constriction is made between the nozzle side and the support side of the glass flow melt and a support is then removed from the support member to separate the glass gob from the glass milk flow at the constriction. The glass gob is then transferred to a glass forming member that has either stopped removing.

In all three cases, where the glass gob is transferred to a stopped glass forming member, the time during which the glass forming member is stopped for transfer of the glass gob from the support member to the glass forming member is **shorter than** the time required for preparing one glass gob from the glass melt flow with the support member and moving it to the glass forming member.

The method 1-2 is described with regard to Fig. 4 and a description at paragraph [0046] - [0047]. The third method is described at paragraphs [0051]. As explained at paragraphs [0053] - [0056], the time during which the glass forming member is stopped is made **shorter than** the time required for one cycle of preparing a glass gob and transferring it to the glass forming member. As explained at paragraph [0054], in the conventional method of preparing a glass gob from the glass melt flow, the time during which the glass forming method is stopped to let the glass forming member receive the glass gob is made equal to the time required for preparing a glass gob from the glass melt flow. A more rapid time of manufacture results from the present invention and prevents horizontal acceleration and improves quality of the form product. As explained at paragraph [0055], the stop time can be made zero, that is the glass gob can be introduced into the glass forming member while the latter is moving. As explained at paragraph [0056], the time required for stopping when receiving the glass gob can be shorten, such that the maximum displacement speed of the glass forming member can be reduced, the horizontal acceleration exerted on the glass during forming can be diminished, maintaining highly efficient production of high quality glass forming products.

As explained at paragraph [0107], with the disclosed method, a described weight of glass is first received by the support member, making it unnecessary to stop the glass gob forming die while the glass is being received by the nozzle. Accordingly, the invention is suited to methods employing multiple glass gob forming dies and molding glass gobs on the forming molds while moving the forming dies. Examples of the operation of the invention are given beginning at paragraphs [0114].

The three different methods are covered, respectively, by claims 1-3 for the first mode. Applicants have amended these claims to state the method invention in conventional terms where the steps of "moving", "transferring" and "forming" are affirmatively recited. Further, Applicants have emphasized the continuous nature of the flow of the glass melt. Finally, Applicants also added an affirmative statement of the step of forming a glass article by moving at least one glass forming member.

The key feature in all of the claims 1-3 concerns the case where the glass gob is moved to a stopped glass forming member. Here, the claims emphasize that the transfer period during which the glass forming member is stopped for transfer of a glass gob from the support member to the glass forming member is made **shorter than** a gob preparation period. The gob preparation period is defined as the time required for preparing one glass gob from the continuous glass melt flow using the support member and transferring the glass gob to the glass forming member. This feature emphasizes that the period of stoppage is **less than** the time required to prepare one glass gob.

Claims 5-7

In accordance with a second mode of the invention, three similar manufacturing methods are utilized and in the case where the glass gob is transferred to a stopped glass forming member, the period during which the glass forming member is stopped for transfer of the glass gob from the support member to the glass forming member is made less than or equal to 70% of a cycle, as explained at paragraphs [0029] - [0031]. Fig. 2 shows an example of the operation of a drop cutting machine with support member for separating glass gobs from the glass melt flow, as described at paragraphs [0039] - [0045].

With respect to the second mode, the application teaches at paragraphs [0057] - [0066], that common features with the first mode exists and that the stopping time for transferring the glass gob is made less than or equal to 70% of the cutting time. Further, if the stopping time is made zero, that is the glass gob is introduced into a moving glass forming member, the speed at which the glass forming member moves when introducing the glass gob can be made slower than in other cases.

With regard to claims 5-7, the stopping period is less than or equal to 70% of a fixed cycle period comprising receiving a front end of the glass melt flow by a support member and dropping the support member while rapidly then the flow rate of the glass melt flow to separate the glass gob, or supporting the front end to form a constriction and dropping the support member to separate the glass gob, or forming the constriction and removing support from the support member to separate glass gob.

The three different methods for the second mode are covered by claims 5-7. Applicants also have amended these claims to state the method invention in conventional terms where the steps of "moving", "transferring" and "forming" are affirmatively recited. Further, Applicants have emphasized the continuous nature of the flow of the glass melt. Finally, Applicants also added an affirmative statement of the step of forming a glass article by at least one moving glass forming member.

Claims 15-17

These claims are generally directed to a method of manufacturing glass gobs in which glass gobs are formed from a glass melt flowing out of a nozzle. Prior to dripping from the nozzle, the glass melt flowing out is brought into contact with a support member beneath the lower end of the glass melt flowing out of the nozzle, the support member is then moved downward from beneath the lower end of the glass melt at a speed greater than the flow speed of the glass melt, causing a glass gob of prescribed weight to drip onto the support member from the nozzle. In order to form the gob, the support member is moved downward in such a manner that contact is temporarily broken between the support member and the lower end of the glass melt.

As explained at paragraph [0108]:

> Pulling the glass melt away from the support member reduces **contact** between the support member and the glass melt or results in a temporary state of no **contact** during that period. Thus, compared to when the glass melt is received by the forming die, the period of **contact** with the glass melt is shorter and the amount of volatile matter in the glass melt adhering to the glass-receiving surface of the support member can be reduced. When such volatile matter accumulates, it is eventually incorporated into the glass, compromising the quality of the glass gobs. However, the operation of pulling away the support member solves this problem.

Ikeuchi et al

The Ikeuchi et al reference is distinguishable from the invention as now defined in

amended claim 15 on the basis of the limitation in claim 16 and the limitation supported in paragraph 0082 of the specification, that the glass melt is cooled when brought into contact with the support member that is cooled by circulation of a coolant through the support member.. The advantage of cooling of the glass melt by contacting with the support member is mentioned in the same paragraph. Thus, maintenance of constant glass flow rate by keeping the nozzle temperature constant can be easily accomplished.

In contrast, Ikeuchi teaches that when the support member temperature is too low, wrinkles readily occur in the glass; and that the heating coil 12 is effective for high temperature control. (Column 5, lines 2 to 5). However, Ikeuchi is silent regarding cooling of the support member with circulation of a coolant through the support member.

Thus, the added limitation to claim 15 will make this claim allowable.

Conclusions

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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